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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,979	12/06/2001	Satoshi Maruyama	216935US0	4984
22850	7590	10/05/2005		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/002,979

Applicant(s)

MARUYAMA ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005 and 07 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3, 5-7 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3, 5-7 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 7, 2005 has been entered.

Response to Amendment

2. In response to the amendment received April 7, 2005:
- a. Claims 1, 5-7 and 14 are pending;
 - b. The 102 rejection of Liu is withdrawn since the prior art does not sufficiently teach the use of gamma-butyrolactone so as to anticipate the claimed invention;
 - c. The prior art rejections of record are withdrawn except for the 103 rejection to Liu.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7 and 14 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The PVDF homopolymer critical or essential to the

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practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The original written description teaches that the significance of the instant invention appears to lie in the presence of this homopolymer (see subject matter under the subject header "What is achieved by the invention". While claim 3 is drawn to such limitations, claims 7 and 14 are not. Therefore the scope of which claim 7 and 14 extend does not include the features disclosed as the inventive concepts of the instant application. See MPEP § 2163.05. Applicant is advised to amend the claims to further include the core features of the invention in combination with the limitations currently set forth in claim 7 to overcome this rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 5,720,780 (Liu) in view of Humphrey and JP '868.

In the event that Applicant shows criticality of the process of obtaining the homopolymer:

Liu discloses an electrode composition comprising a PVDF homopolymer (abstract). The electrolyte can be LiBF₄ (col. 8, ll. 24-27) and the solvent for the

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electrolyte can be a lactone, γ -butyrolactone in particular (paragraph bridging columns 7 and 8).

Liu uses KYNAR 741 homopolymer (see Example 2 and Tables I and II). Kynar 741 has an inherent crystallinity between 50 and 60%, thus greater than 30% and an inherent molecular weight of 323×1000 g/mol, thus greater than 50,000 (as applied to claim 2). Applicant is invited to review the manufacture's web page, in particular, <http://www.atofinachemicals.com/literature/pdf/19.pdf>. The literature therein discloses the crystallinity and molecular weight of Kynar. The device is used in a lithium secondary battery (as applied to claim 3).

The differences between instant claim 3 and Liu are that Liu does not disclose of the PVDF obtained from emulsion polymerization (claim 3), the salt being a lithium fluoroborate salt in a γ -butyrolactone solvent (claim 3).

With respect to a PVDF polymer obtained from emulsion polymerization:

Humphrey discloses an electrode composition comprising a PVDF homopolymer (abstract and col. 5, ll. 9-43). The PVDF is preferably formed by emulsion polymerization to provide for a high-purity polymer.

The motivation for employing a PVDF homopolymer obtained by emulsion polymerization is it that it would have provided a higher purity polymer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Liu by employing a PVDF homopolymer obtained by emulsion polymerization since it would have provide a higher purity polymer.

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With respect to the electrolyte being lithium fluoroborate and the solvent being a lactone and further of the electrolyte further containing a cyclic carbonate in the volume ratio of 3/7-1/9 ethylene carbonate to γ -butyrolactone:

Liu discloses that a number of electrolyte materials and solvents can be used in the battery of Liu. For example the electrolyte can be LiBF_4 (col. 8, ll. 24-27) and the solvent for the electrolyte can be a lactone, γ -butyrolactone in particular (paragraph bridging columns 7 and 8).

JP '868 discloses that it is advantageous to provide a LiBF_4 electrolyte in a nonaqueous solvent containing over 50-95% vol. γ -butyrolactone (abstract and paragraphs [0049]-[0051] and [0153] as applied to claims 3).

The motivation for using the electrolyte composition of JP '868 is that it provides a battery having improved charge-and-discharge cycling, a high current discharge property.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Liu by providing a LiBF_4 electrolyte in a nonaqueous solvent containing over 50-95% vol. γ -butyrolactone since it would have provided a battery having improved charge-and-discharge cycling, a high current discharge property.

Response to Arguments

5. Applicant's arguments filed April 7, 2005 and July 7, 2005 have been fully considered but they are not persuasive.

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Applicant's arguments fail to show a side-by-side comparison between the prior art rejection of record and the instant claims as to unexpected results.

An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). "A comparison of the claimed invention with the disclosure of each cited reference to determine the number of claim limitations in common with each reference, bearing in mind the relative importance of particular limitations, will usually yield the closest single prior art reference." *In re Merchant*, 575 F.2d 865, 868, 197 USPQ 785, 787 (CCPA 1978) (emphasis in original). Where the comparison is not identical with the reference disclosure, deviations therefrom should be explained, *In re Finley*, 174 F.2d 130, 81 USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. *In re Armstrong*, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from example were inconsequential). See MPEP § 716.02(e).

The comparisons made are between the disclosed invention of the instant application and comparative examples in the instant application. It is not a comparison between the claimed subject matter and closest prior art of record.

Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support."

The claims do not require the properties or characteristics argued by applicant.

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Furthermore, the conclusion by the Declarant in item 5 is stated as their opinion and thus also not convincing.

The prior art of Humphrey recognized the same benefits of providing the PVDF formed by emulsion polymerization since it provides for a high-purity polymer.

Claim Rejections - 35 USC § 103

6. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Humphrey and JP '868 as applied to claims 3 above, and further in view of U.S. patent No. 4,668,595 (Yoshino).

The differences not yet discussed are of the particulars of the cathode active substance (claims 5 and 6) and of the amount of γ -butyrolactone in the electrolyte (claim 5).

With respect to the amount of γ -butyrolactone in the electrolyte:

As discussed above, JP '868 teaches of using amount of γ -butyrolactone in the electrolyte in the range set forth in claim 5.

The motivation for using the electrolyte composition of JP '868 is that it provides a battery having improved charge-and-discharge cycling, a high current discharge property.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Liu by providing a LiBF₄ electrolyte in a nonaqueous solvent containing over 50-95% vol. γ -butyrolactone since it would have provided a battery having improved charge-and-discharge cycling, a high current discharge property.

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With respect to the particulars of the cathode:

Yoshino discloses of a lithiated cobalt oxide cathode wherein Sn is added to the cathode active material in an amount from 0.001-0.1 relative to 0.85-1.0 of cobalt (col. 4, ll. 10-52 and col. 11, ll. 46-52).

The motivation for providing an additive material of Sn to a lithiated cobalt oxide within the range of Yoshino is that it improves the cycling particularly in deep charging and discharging cycles (col. 4, ll. 35-52).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Liu by providing an additive material of Sn to a lithiated cobalt oxide within the range of Yoshino since it would have improved the cycling particularly in deep charging and discharging cycles.

Response to Arguments

7. Applicant's makes no further arguments to the rejection of claims 5-6 apart from those arguments drawn to the rejection of claim 3, discussed above and incorporated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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FAXES received after 4 p.m. will not be processed until the following business day.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc



October 3, 2005